unknown fungus." A young Peziza occurred in Weyer's Cave, it was not in fruit, was colorless, and impossible to determine specifically. A colorless Agaric also occurred in Weyer's Cave.

The temperature of Weyer's Cave on May 18th, was 55°–56° Fahr. for both water and air; that of Zwingle's and Bat Cave (Carter caves) was ascertained by Prof. Shaler to be 48° for the water. Dr. Sloan ascertained the temperature of the brook in Bradford Cave to be 55° on May 9th. The temperature of Mammoth Cave is 59° the year around, according to Prof. B. Silliman. Mr. H. W. Conrad, proprietor of Wyandotte Cave, informs me that the temperature of Wyandotte Cave varies from 54° to 57° F.; that of Little Wyandotte Cave in April is 50°.

NOTES ON SPIDERS FROM CAVES IN KENTUCKY, VIRGINIA AND INDIANA.

BY J. H. EMERTON.

THE collection of cave spiders contained about one hundred specimens of eleven species. Two species were found only about the mouths of caves. These are *Theridion vulgare* Hentz, a spider found all over the country in shady places, and a large species of Meta, which has been found in similar situations in Massachusetts and New Hampshire, and resembles *Epeira fusca* Blackwall. One young spider allied to Tegenaria was taken in Fountain Cave, Virginia, and four specimens of a species of the same family were found in small caves in Carter county, Kentucky; all were immature except one female, and none showed any subterranean characters. The remaining six species, all belonging to the *Theridiidæ*, were found in considerable numbers in the larger caves where there is little or no light and the climate is little affected by outside changes. One species of Linyphia from Weyer's Cave, Virginia, has the eyes of the normal size and number, and the colors and markings of some specimens are as bright as on spiders of the same family living in cellars or shady woods. The other five species are all pale in color and show some unusual condition of the eyes, three species having the front middle pair very small, one having all the eyes small and colorless,

with the front middle pair wanting in the males and some females, and one species being entirely without eyes. Following are descriptions of the last six species.

Nesticus pallidus n. sp.—Plate 1, Figs. 22–27. Cephalothorax and legs pale orange-brown, abdomen yellowish-white with brown hairs. Length of female 3.5 mm. Cephalothorax 1.5 mm. long and nearly as broad, little elevated in front; three lines of hairs from the eyes to the dorsal pit. Front middle eyes black and half as large as the others, nearly touching each other. Rear middle eyes separated from each other by their diameter and from the front middle eyes by half that distance; lateral eyes in pairs separated from the middle eyes by half their diameter. Mandibles half as long as the cephalothorax. Maxillæ and labium short and wide. Palpal claw long and slender with six teeth along the middle. Legs 1, 4, 2, 3. 1st pair 10 mm., 2d 8.25, 3d 8.15, 4th 9.6, thinly covered with long hairs and without spines. Tarsal claws long and slender, the lower with two teeth, the upper with 9 or 10, Epigynum fig. 27; the sacs showing through the skin in some specimens. The only male taken had not finished moulting and was much distorted by the alcohol. The palpus which had cast its skin is shown in fig. 26, the penis is raised from its natural position, which is in a groove passing spirally round the end of the palpal organ to a fleshy conductor. A long process with two teeth at the end branches from the base of the tarsus.

Fountain Cave, next to Weyer's, Virginia, among stalactites where there was no daylight. Several loose cocoons were found, one containing thirty or forty young just hatched (Packard).

Nesticus Carteri n. sp.—Plate I, Fig. 28. Cephalothorax and legs light yellow, hairs shorter than in *N. pallidus*. Abdomen in some specimens with indistinct gray markings. Eyes smaller and farther separated from each other than in *N. pallidus*. Epigynum fig. 28. This species is otherwise much like *N. pallidus*. Bat Cave, Zwingle's Cave, Carter Co., Ky. (Packard). A cocoon collected by Mr. Packard, from Bradford Cave, Ind., contains young, which had passed their second moult, probably of this species.

Linyphia subterranea n. sp.—Plate I, Figs. 29–31. Cephalothorax and legs yellowish-brown, in some specimens reddish. Abdomen white with brown hairs, in two specimens from Zwingle's Cave gray with white spots. Eyes 8, fig. 30, white surrounded by a dark border, in one specimen colorless without dark borders. Front middle eyes very small and in the two dark specimens from Zwingle's Cave obscured by dark markings on the head. Mandibles with seven teeth in front of the claw grooves. Legs short 1, 4, 2, 3, spines on patella and tibia. Under claw of tarsus with two teeth, the upper claws with eight or nine. No claw on palpi. Epigynum external, as long as the maxillæ, extending backward along the under side of the abdomen (fig. 29–31) or when the abdomen is distended projecting out from it at a right angle.

Under stones in Carter and Wyandotte caves (Packard).

Linyphia Weyeri.—Plate I. Figs. 7–12. Cephalothorax and legs yellow-brown, abdomen from dark gray to white. Length of ♀ 2.25 mm. Cephalothorax wide and but little elevated in front in either sex. Front middle eyes near each other on a black spot, rear middle eyes separated by their diameter and by the same distance from the front middle eyes, lateral eyes in pairs, each pair surrounded by a black area and distant twice its width from the middle eyes. Mandibles long, spreading apart at the tips and inclined backward toward the maxillæ, beyond the ends of which they extend a third of their length in the female and farther in the male; 5 long teeth in front of the claw groove. No palpal claw. Legs 1, 4, 2, 3, first pair 4 mm. long in ♀ and 4.4 mm. in ♂, with two spines on femur, one on patella and two on tibia. Under claw of tarsus with one tooth, upper claws with nine or ten teeth. Epigynum with an oval opening behind, twice as wide as long, in front of which is a short, flexible appendage, fig. 11. Palpus of male, figs. 9 and 10. The tarsal process is a small hook on the upper side, the penis is long, and passes one and a half times round the palpal organ, supported through nearly its whole length by a wide thin conductor ending in a hard tooth. Under the end of the penis is a soft brush-like appendage, and beside it two hard processes.

Weyer's Cave, Virginia, in darkness, but not far from the entrance (Packard).

Linyphia incerta n. sp.—Plate I. Figs. 13–21. Length 2 mm. Cephalothorax and legs orange-brown, abdomen white with short, fine, brown hairs. Cephalothorax 1 mm. long and two-thirds as wide; in the male elevated in front, fig. 20, and furnished with longer hairs than in the female. Eyes small and colorless, and separated far from each other, figs. 18 and 21; the front middle pair are very small, hardly larger than the circles around the bases of the hair by which they are surrounded, and only distinguished from them by wanting the dark rim which surrounds the hair circles. In 5 females from Fountain Cave all the eyes are present, fig. 18; in one female one of the front middle eyes is wanting. In 3 males from the same cave both front middle eyes are wanting, as in fig. 21; in one male one only of the front middle pair is wanting. In 4 females and 1 male from Bat Cave, Carter Co., Ky., the front middle eyes are wanting. Mandibles long and spreading at the tips, inclined backward toward the maxillæ, seven teeth in front of the claw groove, which are longer in the males. No palpal claws. Legs 1, 4, 2, 3, longest 4.75 mm. Tarsal claws short and slender, under claw with one tooth, upper claws with 7 or 8 teeth. Spines on patella and tibia. Epigynum with a small oval opening behind with dark brown border. Palpus of ♂, fig. 17, having a sharply-curved process at the base of the tarsus. The penis is supported by a stout conductor nearly to its end where it passes a soft brush-like appendage.

Fountain Cave, Virginia, among stalactites in company with *Nesticus pallidus* (Packard), also in Bat Cave, Carter Co., Ky. (Shaler & Packard).

Anthrobia mammouthia. Plate I, Figs. 1–6. In 1844, Tellkampf described and figured roughly in Wiegmann's Archiv fur Naturgeschichte, several arthropods from the Mammoth Cave, among them an eyeless spider, which he referred with doubt to the Mygalidæ, apparently because he saw only 4 spinnerets. The eyeless spiders found by Dr. Packard in the Mammoth Cave in 1874 agree generally with Tellkampf's description, and his figure 13 represents quite well the outline of a specimen, flattened by pressure between two glasses. No other eyeless spider was found, and no other which could be identified with Tellkampf's description. There seems, therefore, little doubt that these are spiders of the same species as those described by Tellkampf. Adults, 1.5 mm. long, pale brownish-yellow, abdomen almost white with brown hairs, ends of palpi, palpal organs and epigynum reddish-brown. Cephalothorax with scattered hairs in front. No eyes. Mandibles with 4 long teeth in front of the claw groove. Maxillæ short and wide. Sternum wide and hairy. Legs 1, 4, 2, 3, longest about 2.5 mm., hairy, with spines on patella and tibia. Under tarsal claw with one tooth, the upper claws with 6 or more short teeth. No palpal claw. Palpus of ♂, fig. 3, with a long process on the outside of the tibia ending in a sharp hook. The tarsal process forms a small thin hook. Palpal organ very simple, the penis very short and accompanied by a soft, thin appendage. Spinnerets short, Hypopygium ⅓ the length of the first pair.

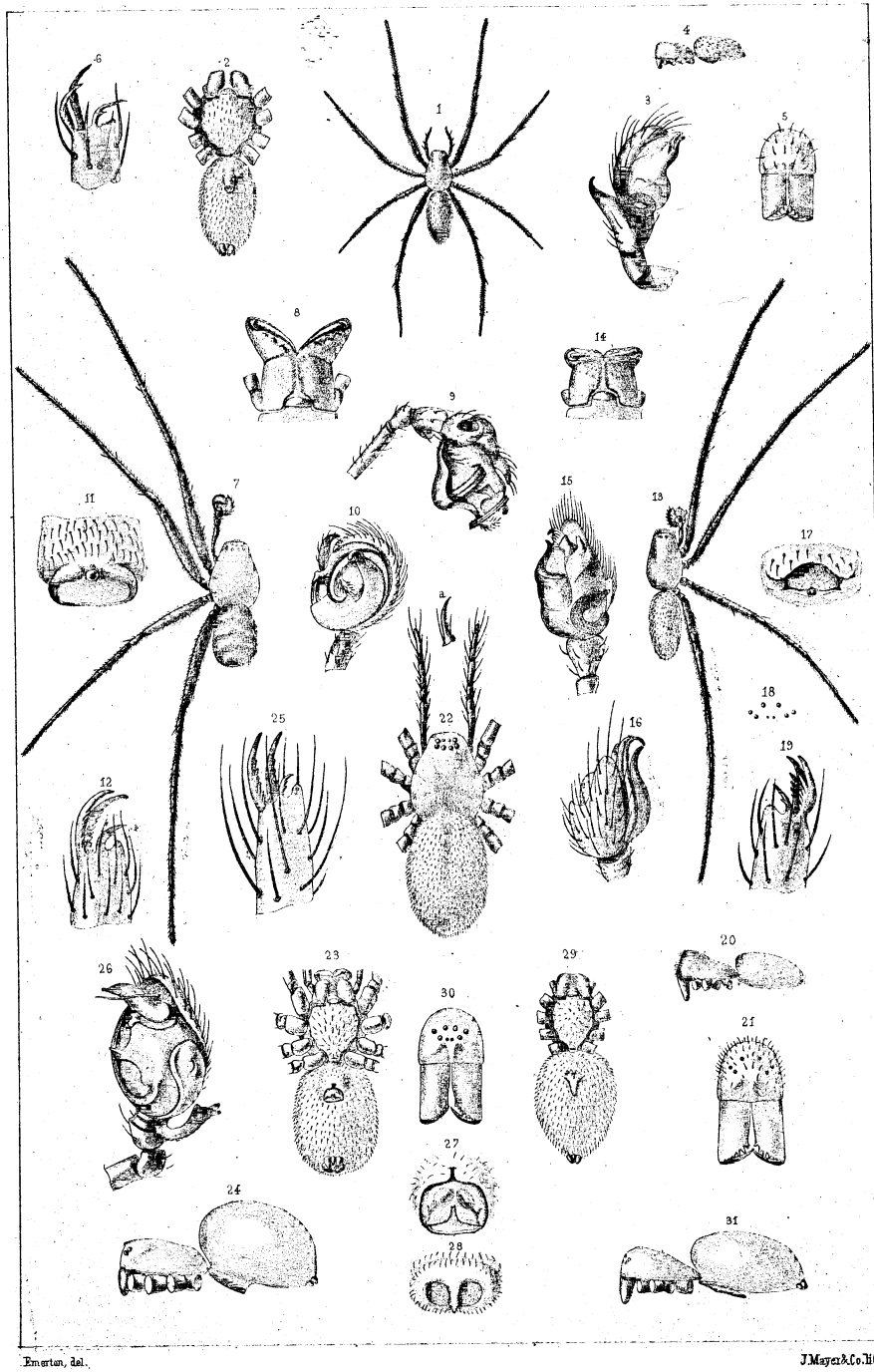
Mammoth Cave and Proctor's and Diamond caves, under stones (Sanborn & Packard). Small flat cocoons were found with some specimens, containing small numbers of eggs which were unusually large in proportion to the size of the spider.

[In this connection it may be of interest to learn the opinion of Dr. T. Thorell, the accomplished arachnologist of Upsala. Upon receiving a specimen of *Anthrobia mammouthia*, which I sent him, he writes me that "the Anthrobia if it really is the true *A. mammouthia* Tellkampf, scarcely differs from the genus Erigone by anything more than the want of eyes; it may, however, be added as a peculiarity, that the three long and slender tarsal claws are quite smooth, neither dentated nor pectinated. The species belong most certainly to the family *Theridiidæ*."

On the other hand on the receipt of a specimen of the same species of spider and from the same cave (Mammoth) as that from which the specimen was taken which was sent Dr. Thorell, M. Simon of Paris writes me that "the Anthrobia is not allied to *Mygalidæ*, as was supposed from the imperfect description of Tellkampf, but to our *Dysderidæ*, and the genus Leptoneta, only it is blind."—A. S. P.]

EXPLANATION OF PLATE I.

1. Anthrobia mammouthia ♀.
2. " " ♀, under side.
3. " " palpus of ♂.
4. " " ♀ side view.
5. " " front of head and mandibles.
6. " " foot of first pair.
7. Linyphia Weyeri ♂.
8. " " maxillæ and mandibles of ♂.
9–10. " " palpus of ♂.
11. " " epigynum.
12. " " foot.
13. Linyphia incerta ♂.
14. " " ♀ maxillæ.
15–16. " " palpus of ♂.
17. " " epigynum.
18. " " eyes of ♀ from Fountain Cave.
19. " " foot.
20. " " ♂ side view.
21. " " ♂ front of head and mandibles.
22. Nesticus pallidus ♀.
23. " " ♀ under side.
24. " " ♀ side view.
25. " " ♀ foot.
26. " " palpus of ♂.
27. " " epigynum.
28. Nesticus Carteri ♀ epigynum.
29. Linyphia subterranea ♀ under side.
30. " " ♀ front of head and mandibles.
31. " " ♀ side view.



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CAVE SPIDERS OF KENTUCKY, ETC.